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IMPROVING THE PROFICIENCY OF MECHANICAL ACTIVITIES PERFORMED BY UTAH'S AGRICULTURALISTS.

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THE MAJOR PURPOSES OF THIS STUDY WERE TO--(1) IMPROVE THE CURRICULUM IN AGRICULTURAL MECHANICS FOR THE PREPARATION OF VOCATIONAL AGRICULTURE TEACHERS AT UTAH STATE UNIVERSITY, (2) SERVE AS A GUIDE IN CHANGING AND DEVELOPING FUTURE COURSES IN AGRICULTURAL MECHANICS FOR ALL-DAY STUDENTS, (3) DISCOVER THE NEEDS FOR INSERVICE TRAINING PROGRAMS, AND (4) IDENTIFY AREAS OF INSTRUCTION WHICH MIGHT BE OFFERED AT THE POST-HIGH SCHOOL LEVEL. THE DATA WERE OBTAINED FROM 670 USABLE SURVEY FORMS COMPLETED BY VOCATIONAL AGRICULTURE STUDENTS' PARENTS RESIDING IN 14 DESIGNATED COUNTIES. ONE VOCATIONAL AGRICULTURE TEACHER IN EACH COUNTY WAS SELECTED TO ADMINISTER AND COLLECT THE SURVEY FORMS. SOME FINDINGS WERE--(1) PARENTS OF HIGH SCHOOL VOCATIONAL AGRICULTURE STUDENTS DESIRED ADDITIONAL TRAINING IN ALL AREAS OF AGRICULTURAL MECHANICS, (2) 33 PERCENT OF THE FARMS WERE UNDER 100 ACRES IN SIZE, (3) AGRICULTURE TEACHERS WERE TEACHING MORE STUDENTS FROM PART-TIME THAN FULL-TIME FARMS, AND (4) 73 PERCENT OF THE FARMERS FELT THEY SHOULD PERFORM 15 OF THE 16 LISTED FARM SHOP ACTIVITIES. SINCE UTAH FARMERS PERFORM MANY MECHANICAL ACTIVITIES FOR WHICH THEY ARE NOT PROPERLY TRAINED, ADDITIONAL TRAINING IS NEEDED IN ALL AREAS OF MECHANICS. INCREASED EMPHASIS SHOULD BE PLACED ON MECHANICAL ACTIVITIES TO SERVE THE GROWING NUMBER OF PART-TIME FARMERS. THE MECHANICAL JOB OPERATIONAL SURVEY FORM WITH AN INSTRUCTIONAL LETTER FOR PARENTS IS INCLUDED. (WB)

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IMPROVING THE PROFICIENCY OF MECHANICAL ACTIVITIES PERFORMED BY UTAH'S AGRICULTURALISTS.

by

Dr. Von H. Jarrett

PURPOSE: The major purpose of this study was to determine the following: (1) mechanical activities performed by farmers, (2) whether the farmers should perform these activities, (3) areas where additional training would be desirable, (4) effect of full-time and part-time farming upon the types of mechanical activities performed, (5) size and type of farming operations, (6) tools farmers possessed, (7) agricultural machines farmers had to perform mechanical activities, and (8) changes that should be made in the pre-service training curriculum.

The study was conducted for the following reasons:

1. To serve as a guide in changing and developing future courses in agricultural mechanics for all-day students in Utah.
2. To improve the curriculum in agricultural mechanics at Utah State University for the preparation of vocational agriculture teachers.
3. To discover the needs for in-service training programs.
4. To identify areas of instruction which might be offered at the post high school level.

The data reported in this study were obtained by means of an information form with the population determined by a statistical sampling technique. Fourteen counties were designated and one teacher was selected from each county. Each designated vocational agriculture teacher requested his students to have their parents complete the survey form. A total of 934 forms were distributed with 819, or 88 per cent returned, of which 670 or 72 per cent were usable.

SUMMARY:

1. Parents of high school vocational agriculture students desire additional training in all areas of agricultural mechanics.
2. Thirty-three percent of the farms were under 100 acres in size.
3. The returns indicated that instructors of vocational agriculture in Utah are teaching more students from part-time than from full-time farms.

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4. Thirty-four percent of the respondents classified themselves as general farmers. Fifty-six percent lived on their farms. Only five percent indicated that their annual sales and inventory increase exceeded $30,000. Slightly more than half of the farmers had vocational agriculture in high school. Also, more than half of the farmers had shops on their farms.
5. Under the category of farm power and machinery, over 50 percent of those surveyed were performing 12 of the listed activities, while 16 of the activities were performed by more than 40 percent of the farmers. More than 50 percent thought that 21 of the activities should be performed.
6. Sixty-nine percent of the farmers indicated they should perform all activities listed on the survey form pertaining to farm buildings and conveniences.
7. Only three of the seven activities in soil and water management were being performed by more than half of the farmers.
8. Sixty-two percent of the farmers indicated that they should be performing all of the listed activities in farm electrification.
9. Seventy-three percent of the farmers felt they should perform 15 of the 16 farm shop activities.

CONCLUSIONS:

1. It is obvious that Utah farmers perform many mechanical activities for which they are not properly trained.
2. Additional training is needed in all areas of mechanics. The greatest needs are in electrification, farm power and machinery, buildings and conveniences, shop skills, and soil and water management.
3. Increased emphasis should be placed on mechanical activities to serve the growing number of part-time farmers.
4. The most immediate changes that should be made in the curriculum for the State of Utah are:
   (a) More teaching in the area of electricity.
   (b) Increased emphasis on service and maintenance of farm trucks.
   (c) Additional training regarding internal combustion engines.
   (d) More emphasis on farm buildings and conveniences.

UTAH STATE UNIVERSITY

DARYL CHASE, PRESIDENT

LOGAN, UTAH, 84321

COLLEGE OF AGRICULTURE

VEARL R. SMITH, DEAN

DEPARTMENT OF AGRICULTURAL EDUCATION

September 11, 1967

Dear Parent:

An effort is being made to improve and strengthen the Agricultural Mechanics program of instruction in the high schools of Utah. You are in a key position as a farmer and parent of a student to give information that will be invaluable in developing a program in high school to better meet the practical needs of farmers and farm youth. Many who will enter agricultural occupations other than farming will also benefit from practical instruction in Agricultural Mechanics.

The enclosed survey form has been made up so that you can furnish the desired information by placing check marks in the appropriate columns. These check marks will indicate which mechanical jobs you do, those jobs that you believe ought to be done on the farm, and those areas in which additional training is needed. By giving about fifteen minutes of your time, you'll be making a contribution that should result in a more practical and up-to-date course in Agricultural Mechanics.

With the data supplied on the forms, it will be possible to improve the teaching at the local level, better prepare teachers of vocational agriculture before they accept teaching assignments, and to give in-service classes to upgrade teachers on the job.

A numbering system is being used to assure the return of the survey forms. However, all forms will be stripped of numbers; and copies will be placed in a box so that all information will be confidential. With such confidential information from more than 1,000 persons over the State of Utah, some wonderful progress can be anticipated in a field that is so vital to success in agriculture.

Thanks for your part in improving the instructional program by completing the survey form.

Yours truly,

Von H. Jarrett

Von H. Jarrett
Associate Professor
Agricultural Education

Enclosure
VHJ:cat

MECHANICAL JOB OPERATIONAL SURVEY

INSTRUCTIONS: Those you do, those you believe you ought to do, and those for which you need training. If you check "NO" in the column "Should Farmers Do This", it is obvious that you wouldn't suggest a need for training for that operation.

INSTRUCTIONS FOR COMPLETING PART I

Please check YES or NO to indicate whether or not you perform these jobs.

Please check YES or NO in these two columns for each job listed below. Your opinion is wanted.

Please check this column if you feel you need additional training for a particular job.

Farm Power and Machinery	DO YOU DO THIS? YES	DO YOU DO THIS? NO	SHOULD FARMERS DO THIS? YES	SHOULD FARMERS DO THIS? NO	I NEED MORE TRAINING ON THIS
1. Diagnosing gasoline engine troubles					
2. Diagnosing diesel engine troubles					
3. Check compression of cylinders					
4. Adjust governor speed					
5. Replace piston rings					
6. Replace sleeve sets with new kit					
7. Grind or reface valves					
8. Measure crankshaft with micrometer					
9. Replace crankshaft bearing					
10. Replace clutch and adjust					
11. Install a carburator kit					
12. Replace points and condensor					
13. Service a hydraulic system					
14. Determine characteristics of fuels and lubricants					
15. Recondition and overhaul tractor transmission					
16. Overhaul small engine (example: Briggs and Stratton)					
17. Determine horsepower rating of tractor using a dynamometer					
18. Determine economics in purchasing farm machinery					
19. Weld broken and worn parts on a machine					
20. Hardsurface machinery parts					
21. Calibrate grain drill					
22. Properly adjust combine					

(Cont'd Page 2)

	DO YOU DO THIS? YES	DO YOU DO THIS? NO	SHOULD FARMERS DO THIS? YES	SHOULD FARMERS DO THIS? NO	I NEED MORE TRAINING ON THIS.
23. Properly adjust plows.					
24. Calibrate field sprayer.					
25. Paint machinery.					
26. Winterize machinery for non-seasonal use..					
(Others)_____					
_____					
Farm Buildings And Conveniences					
1. Construct forms for placing concrete					
2. Determine proper ingredient for concrete					
3. Finish concrete.					
4. Lay up concrete block.					
5. Apply roofing materials.					
6. Paint farm building.					
7. Construct major farm building. . . .					
8. Construct and repair fences.					
9. Install ventilating system					
10. Apply insulating materials					
11. Install plumbing for livestock water system.					
12. Repair plumbing and bathroom fixtures					
13. Repair farm structures					
14. Lay out a building foundation. . . .					
15. Read and understand blueprints . . .					
16. Make a working sketch of a building.					
17. Plan and draw details of project (cattle shute) (horse trailer) (etc.)					
(Others)_____					
_____					
Soil and Water Management					
1. Use a farm level					
2. Lay out an irrigation system					
3. Construct irrigation headgates . . .					
4. Measure amount of irrigation water .					
5. Construct farm pond.					
6. Lay out overhead irrigation system .					
7. Lay out for a ditch lining					
(Others)_____					
_____					

(Cont'd Page 3)

Electrification	DO YOU DO THIS? YES	DO YOU DO THIS? NO	SHOULD FARMERS DO THIS? YES	SHOULD FARMERS DO THIS? NO	NEED MORE TRAINING ON THIS
1. Plan electrical wiring needs.					
2. Install wiring between farm buildings					
3. Install main switch circuit breakers.					
4. Install interior electrical wiring. .					
5. Select proper electrical wiring materials					
6. Install switches and outlets.					
7. Install lighting fixtures					
8. Select proper motor for farm use. . .					
9. Reverse rotation of motor					
10. Hook up or wire electric motor. . . .					
11. Clean and service an electric motor .					
12. Install an electric motor properly. .					
13. Ground all elctrical equipment. . . .					
14. Install electric fence.					
15. Install yard lights					
(Others)_____					
_____					
Farm Shop					
1. Construct metal projects (feeders) (squeeze chute) (etc.).					
2. Construct wood project for the farm .					
3. Repair major equipment on the farm. .					
4. Sharpen own hand tools.					
5. Use arc welder.					
6. Make freehand sketches.					
7. Figure bill of materials.					
8. Use oxy-acetylene to cut and weld . .					
9. Bend and shape hot metal.					
10. Construct sheet metal projects. . . .					
11. Repair sheet metal.					
12. Solder sheet metal projects.					
13. Use reamer, taps, and dies					
14. Use metal lathe					
15. Replace handles in hand tools					
16. Recondition hand tools.					
(Others)_____					
_____					

PART II

Major Pieces of Farm Machinery

Please check_____the number of pieces of farm machinery and shop equipment which you have on your farm.

(Con'd Page 4)

	1	2	3 or More
1. Tractors.			
2. Combines.			
3. Grain drills. . . .			
4. Flows			
5. Mowers.			
6. Rakes			
7. Balers.			
8. Manure spreaders. .			
9. Beet harvesters . .			
10. Cultivators			
11. Feed elevators. . .			
12. Milking machines. .			
13. Field sprayers. . .			
14. Trucks.			
15. Self-propelled windrower			
16. Electric motors all sizes			
17. Small engines less than 5 h. p. . . .			

Shop Equipment

1. Arc welder. . . . . _____
2. Acetylene welder. . . . _____
3. Drill press . . . . . _____
4. Power saw.. . . . . _____
5. Power grinder . . . . . _____
6. Paint sprayer . . . . . _____
7. Battery charger . . . . _____
8. Air compressor. . . . . _____
9. Metal lathe . . . . . _____
10. Port. power hand saw. . _____
11. ½ in. power drill . . . _____
12. ¼ in. power drill . . . _____
13. Steam cleaner . . . . . _____
14. Power chain saw . . . . _____
15. Set of mechanical tools _____
16. Engine tune-up kits . . _____
17. Engine overhaul tools . _____
18. Overhead lifting equip. _____
19. Volt meter. . ... _____
20. Amperemeter . . . . . _____

Do you farm full time?_____ part time?_____. Do you live on your farm?_____

Size of farm in acres_____. Acres owned_____. Acres rented_____.

Did you have Vocational Agriculture in high school? _____ YES _____ NO Age_____

Size of Home Farm shop _____ by _____ ft.

Major type of farming operation (such as dairying, poultry, livestock, cash-grain, livestock-grain, vegetable, fruit production, general farming, etc.)

_____

(Write in type of farming)

Approximate annual sales and inventory increase for the year 1966. Under $1,000_____ 1,000-5,000_____ 5,000-15,000_____ 15,000-30,000_____ Over 30,000_____.

Comments:_____

_____

_____